PSYCHE

A JOURNAL OF ENTOMOLOGY

ESTABLISHED IN 1874

Vol. 59 March, 1952 No. 1

CAMBRIDGE ENTOMOLOGICAL CLUB
1874

TABLE OF CONTENTS

Six New Species of *Megistops* with Keys to the Known Species (Coleoptera). *D. H. Blake* 1

Interesting Northern Records for Eastern Hymenoptera (Formicidae and Embolemidae). *W. L. Brown, Jr.* 12

The Female of *Formica opaciventris* Emery (Formicidae). *R. E. Gregg* 13

Correction to the Synonymy of the Ant *Camponotus formosensis* Wheeler. *W. L. Brown, Jr.* 19

A New Genus and Species of Isotomidae (Collembola). *P. F. Bellinger* 20

Mystrium in Australia (Hymenoptera: Formicidae). *W. L. Brown, Jr.* 25

Notes on Some of Osborn's Mallophaga Types and the Description of a New Genus, *Rotundiceps* (Philopteridae). *R. L. Edwards* . 26

Lectotypes of Hagen Species Belonging to Certain Families of Trichoptera. *H. H. Ross* 31

Observations on the Distribution of Tabanidae in the Caribbean Area, with New Records of Species from Trinidad, B. W. I. (Diptera). *E. McC. Callan* 37

CAMBRIDGE ENTOMOLOGICAL CLUB

OFFICERS FOR 1951-52

President	A. G. HUMES
Vice-President	F. Y. CHENG
Secretary	T. EISNER
Treasurer	F. M. CARPENTER
Executive Committee	G. A. EDWARDS J. C. BEQUAERT

EDITORIAL BOARD OF PSYCHE

F. M. CARPENTER — EDITOR
C. T. BRUES
P. J. DARLINGTON, JR.
J. BEQUAERT

PSYCHE is published quarterly, the issues appearing in March, June, September, and December. Subscription price, per year, payable in advance: $3.00 to subscribers in the United States; Canadian and foreign subscriptions $3.35. Single copies, 85 cents.

Cheques and remittances should be addressed to Treasurer, Cambridge Entomological Club, Biological Laboratories, Harvard University, Cambridge, Mass.

Orders for back volumes, missing numbers, notices of change of address, etc., should be sent to the Editorial Office of Psyche, Biological Laboratories, Harvard University, Cambridge, Mass.

IMPORTANT NOTICE TO CONTRIBUTORS

Manuscripts intended for publication, books intended for review, and other editorial matter, should be addressed to Professor F. M. Carpenter, Biological Laboratories, Harvard University, Cambridge, Mass.

Authors contributing articles over 8 printed pages in length will be required to bear a part of the extra expense, for additional pages. This expense will be that of typesetting only, which is about $3.00 per page. The actual cost of preparing cuts for all illustrations must be borne by contributors; the expense for full page plates from line drawings is approximately $6.50 each, and for full page half-tones, $7.50 each; smaller sizes in proportion.

AUTHOR'S SEPARATES

Reprints of articles may be secured by authors, if they are ordered before, or at the time proofs are received for corrections. The cost of these will be furnished by the Editor on application.

The Dec., 1951, PSYCHE (Vol. 58, No. 4) was mailed June 4, 1952

EATON PRESS INC., WATERTOWN, MASS.

PSYCHE

Vol. 59 March, 1952 No. 1

SIX NEW SPECIES OF *MEGISTOPS* WITH KEYS TO THE KNOWN SPECIES (COLEOPTERA)*

BY DORIS H. BLAKE
Arlington, Virginia

The genus *Megistops*, originally based by Boheman[1] on two species supposedly from San Francisco but actually from Ecuador[2], at present contains fifteen species. Eight of these were described from the West Indies, ranging from Cuba to Trinidad, and the other seven from Venezuela (1), Brazil (3), Ecuador (2), and Paraguay (1). The group is for the most part fairly homogeneous in its size, shape and coloring, being composed of small (2-5 mm.), oval beetles with extraordinarily large eyes that in some are contiguous on the occiput. Eight of the species (three from the West Indies) have deep reddish brown or piceous elytra with four large pale spots, five have dark spots on pale yellow elytra, and four (from the West Indies) have streaks or subvittate dark markings. Only five (of which three, I believe, are merely dark color forms of other species) have the elytra of one color. It is not difficult to conceive that all of these color patterns on the elytra are degrees of coloring of the typical four-spotted elytra, varying from nearly pale, with only remnants of spots, to entirely dark.

Recently I have been able to examine many type specimens of Boheman's, Baly's, Jacoby's, Bryant's, and Duvivier's species. Since I have six more to add to the genus and since they comprise two from the West Indies, three from South America and the first one to be described from the mainland of North America (Costa Rica), it seems worth while to give keys to both the West Indian and South American species.

---

* Published with a grant from the Museum of Comparative Zoology at Harvard College.

[1] Boheman, Eugenia Resa, Coleoptera, 1859, p.187.

[2] Blake, Bull. Brooklyn Ent. Soc., vol. 26, 1931, p.8.

Key to West Indian Species

1. Pale yellow except for the dark antennae and dark streaks on legs. Cuba .... *adulta* Suff.
   Elytra with spots or vittae or entirely dark 2
2. Elytra entirely dark 3
   Elytra not entirely dark 5
3. Elytra deep blue, eyes not very close together, Puerto Rico .... *dissita* Blake
   Elytra piceous or reddish brown 4
4. Elytra piceous black. Cuba ...... *rubropustulata* Suff.
   Elytra deep reddish brown. Puerto Rico *tabebuiae* Blake
5. Elytra dark with 4 pale spots 6
   Elytra not with 4 pale spots 8
6. Elytral pale spots elliptical. Trinidad *trinitatis* Bryant
   Elytral pale spots more or less irregular in shape 7
7. Basal pale spot not running parallel to suture but curving away from it towards margin. Harbor Island, Bahamas .... *bahamensis* n. sp.
   Basal pale spot running parallel to suture, sometimes coalescing with apical spot. Puerto Rico *tabebuiae* Blake
8. Elytra pale with 2 dark triangular spots on each in the middle and a dark lateral stripe. Grenada *granulata* Jacoby
   Elytra black, yellow brown or reddish brown with streaks or lines 9

9. Elytra black with 6 red streaks ("litura"). Cuba *rubropustulata* Suff.
   Elytra reddish brown or yellowish brown with streaks 10

10. Elytra reddish brown with pale base and pale streaks down towards the middle and vestiges of other streaks in apical half. Puerto Rico . . . . *fictor* Weise
    Elytra yellow brown with dark brown narrow vittae 11

11. Elytra with heavy black margin joining at middle with a median dark vitta, a sutural vitta and a subsutural vitta often uniting, neither of these median vittae entire. Puerto Rico . . . . *bryanti* n. sp.
    Elytra with a narrow sutural and 3 short median vittae and also dark markings on the humeri and along the margin and near apex. Santo Domingo. *liturata* Olivier

Key to South American Species

1. Elytra dark, without spots. Ecuador *lugubrina* Boheman[3]
   Elytra spotted 2

2. Elytra dark with pale spots 3
   Elytra pale with darker spots 8

3. Elytra 10-spotted. Paraguay . . . . *10-maculata* Bryant
   Elytra 4-spotted 4

4. Large (nearly 5 mm.), oblong, thorax with a median dark vitta, spur at apex of hind tibiae very short and broad. Brazil . . . . *fenestrata* Illiger
   Smaller (2-4 mm.), thorax without a median vitta, spurs on the hind tibiae of the usual length 5

5. The pale basal spot on each elytron curved about from base near scutellum towards margin. Ecuador *4-notata* Boheman

---

[3] Probably dark form of *4-notata* Boheman.

The pale basal spot on each elytron not noticeably curved towards margin 6

6. Beetle elongate oval with elongate basal spot. Venezuela . . . . *pretiosa* Baly

Beetles more oval, less elongate 7

7. About 2.5 mm. in length, elytral basal spot oblong. Amazon, Brazil . . . . *ornata* Baly

About 3.5 mm. in length, elytral basal spot elliptical and extending obliquely towards margin. Trinidad . . . . *trinitatis* Bryant

8. Elytra pale orange yellow, 4 dark spots, the suture and apex dark, lateral margin pale. Brazil *vandepolli* Duvivier

Elytra pale with 4 dark spots or vittae, lateral margin more or less darkened 9

9. Each elytron with an angular spot in the middle, sometimes one at middle of the base, the suture pale. Grenada . . . . *granulata* Jacoby

Suture dark in part or entirely dark 10

10. A large median dark spot common to both elytra, otherwise suture pale. South America . . . . *taurops* n. sp.

Suture dark from base to apex 11

11. Body beneath, femora and tibiae in part dark. Bolivia . . . . *melanoloma* n. sp.

Body beneath, femora and legs pale yellow brown. Argentina . . . . *argentinensis* n. sp.

Megistops bryanti n. sp.

(Plate 1, figure 8)

About 3.5 mm. in length, smooth, oval, faintly shining, pale yellow brown, the elytra with dark brown sutural and lateral margins, covering humeri and wider at apex, and a long but not entire subsutural vitta often connecting with the sutural vitta, and a shorter median vitta connecting with the lateral marginal one below middle; breast and often middle of prosternum deeper brown.

Head pale yellow brown with dark mouthparts, eyes almost meeting on occiput. Antennae brownish, the three basal joints paler beneath. Prothorax not quite twice so broad as long, narrowed anteriorly and with thickened apical angles; pale yellow, in some specimens, with faint traces of five spots, faintly and shallowly punctate. Elytra rather flat, feebly shining and finely alutaceous with obsolete fine punctures; pale yellow brown with deeper brown markings in the shape of a sutural vitta often uniting with a shorter subsutural one, and also with the wide irregular lateral-marginal one before the apex, another even shorter median vitta uniting a little below the middle with the lateral marginal darkening. Body beneath often deeper brown except the pale abdomen and legs; in dark specimens apical half of hind femora deep brown. Length 3—3.7 mm.; width 1.5—1.8 mm.

Type data.—Holotype male and 28 paratypes (U.S.N.M. Cat. No. 60,930), 2 paratypes in M.C.Z. (No. 28,691), all collected by R. G. Oakley on *Tabebuia* sp. June 25, 1934, at Guanica, Puerto Rico.

Other material.—In U.S.N.M. collected by R. G. Oakley on *Tabebuia* sp. Oct. 4, 1933, and on *Scirpus validus* Sept. 29, 1933, both at Ponce, and on *Clusia rosea* by Martorell April 2, 1940, near Rio Piedras; in M.C.Z. one specimen collected by C. M. Matos at Guanica in the Stuart T. Danforth collection.

Remarks.—At first the beetles would seem to be a more heavily marked race of *M. liturata* Oliv., a species occurring in Hispaniola, but dissection reveals an entirely differently shaped aedeagus. *M. liturata* also appears to be a little broader with more granular surface. *M. tabebuiae* from Puerto Rico also feeds on *Tabebuia* but the two beetles are not at all alike either in their external appearance or in their aedeagi, *M. tabebuiae* usually being dark reddish brown to piceous, sometimes with four pale elytral spots or, in pale specimens, with the spots coalescing. The species is dedicated to G. E. Bryant of the British Museum, who has done much work on the genus.

Megistops bahamensis n. sp.

(Plate 1, figure 6)

About 3.5 mm. in length, oval, feebly shining, alutaceous and finely punctate, deep reddish brown with pale yellow prothorax and the elytra with four large pale yellow spots somewhat irregular in shape, the two basal ones being longer than the apical ones.

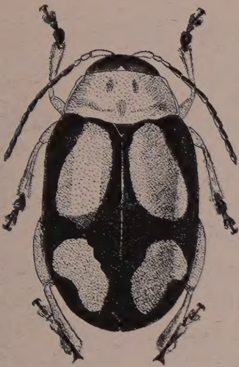
Head yellow brown with darker mouthparts, eyes only slightly separated on the occiput. Antennae reddish brown, the basal joints yellowish below. Prothorax twice as wide as long, narrowed anteriorly with thickened apical angles; surface alutaceous and thickly and finely punctate, in some specimens traces of five indistinct spots. Elytra deep chocolate brown to piceous with four pale yellow spots, the basal one on each elytron being larger and curving irregularly towards the lateral margin, the apical one smaller and usually more rounded. Body beneath usually with the middle of the prosternum and breast and apical half of hind femora deeper brown. Length 3.4-3.7 mm.; width 1.9 mm.

Type data.—Holotype male (U.S.N.M. Cat. No. 60,931) and 6 paratypes, 3 paratypes in M.C.Z. (Type No. 28,690), all collected on Harbor Island, Bahamas, July 8 by H. F. Wickham.

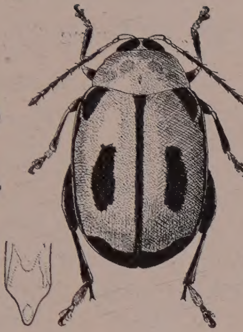
Remarks.—The only West Indian species likely to be confused with this is one of the color forms of *M. tabebuiae* Blake, in which one specimen with deep brown elytra has very faint traces of four small spots and another specimen has the spots so large as to coalesce leaving only the suture and margin dark. These two species have rather similarly shaped but clearly different aedeagi, that of the Bahaman species having a wider, more rounded tip.

EXPLANATION OF PLATE 1

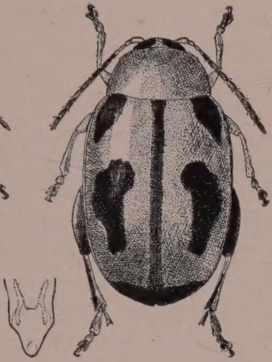
Fig. 1. *Megistops costaricensis* n. sp. Fig. 2. *Megistops melanoloma* n. sp. Fig. 3. *Megistops vandepolli* Duv. Fig. 4. *Megistops argentinensis* n. sp. Fig. 5. *Megistops taurops* n. sp. Fig. 6. *Megistops bahamensis* n. sp. Fig. 7. *Megistops liturata* (Oliv.) Fig. 8. *Megistops bryanti* n. sp.



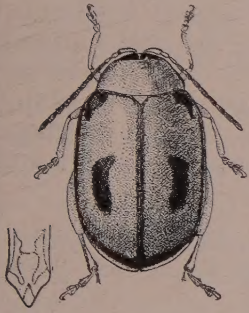
1. Megistops costaricensis



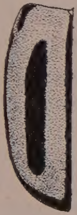
2. Megistops melanoloma



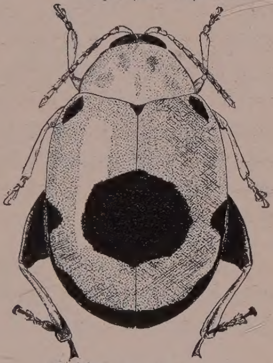
3. Megistops vandepolli Duv.



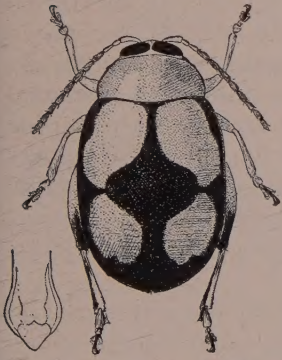
4. Megistops argentinensis



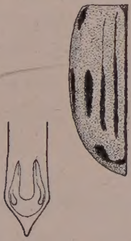
vittate form



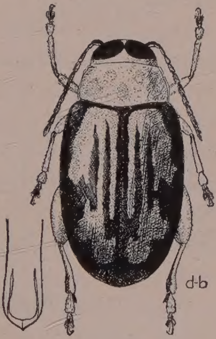
5. Megistops taurops



6. Megistops bahamensis



7. Megistops liturata (Oliv.)



8. Megistops bryanti

BLAKE — MEGISTOPS

Megistops melanoloma n. sp.

(Plate 1, figure 2)

Between 3 and 3.5 mm. in length, oval, feebly shining, head, undersurface, femora and part of tibiae dark, prothorax pale orange yellow, elytra also pale with a black sutural and lateral marginal vitta, a black spot on humerus and a large median spot common to both elytra.

Head with the eyes very little separated on the occiput, deep brown, very finely and densely punctate. Antennae dark brown with the three basal joints pale yellow. Prothorax at base twice as wide as long, very finely and densely punctate, pale orange, in one specimen with five faint spots. Elytra pale orange, finely and faintly punctate, with black markings on humeri, black sutural vitta, and black lateral marginal vitta widening at apex and joined with sutural dark vitta; in the middle of each elytron an elongate black spot in the form of a short vitta. Body beneath and femora black with deep brown coxae and tibiae streaked with black, tarsal joints deep brown. Length 3.2-3.4 mm.; width 2 mm.

Type data.—Holotype male (U.S.N.M. Cat. No. 60,933), collected in May by G. L. Harrington, at Encuentro, Dept. La Paz, Bolivia.

Other material.—One other specimen also collected by G. L. Harrington, at Calisaya, Rio Bopi, Bolivia.

Remarks.—This species is closely related to *M. vandepolli* Duv. described from Santarem, on the Amazon River, and may be only a race of that species. But because of the wide difference in locality coupled with the slight differences in structure, such as the more closely placed eyes and the more narrowed tip to the aedeagus, as well as the darker coloring of the legs and elytra, I believe this is distinct.

Megistops argentinensis n. sp.

(Plate 1, figure 4)

From 2.5-3.5 mm. in length, oval, feebly shining, yellow brown with deeper brown markings on the elytra, a sutural vitta uniting broadly near the apex with a narrow lateral marginal vitta, a humeral dark spot and an elongate spot in the middle of each elytron sometimes becoming a vitta that does not extend to the base.

Head pale with deeper brown mouthparts, finely punctate, eyes nearly meeting on the occiput. Antennae pale brownish with the three basal joints yellowish. Prothorax twice as broad as long at base with thickened apical angles, finely and densely punctate, sometimes very faintly 5-spotted. Elytra a little more shining, distinctly and rather densely punctate, pale with deeper brown markings in the form of a sutural vitta uniting broadly at apex with a lateral marginal vitta, also a spot on humerus and a median elongate spot, sometimes becoming a short median vitta. Body beneath yellowish or reddish brown with paler tibiae and tarsi. Length 2.6-3.5 mm.; width 1.7-2 mm.

Type data.—Holotype male (U.S.N.M. Cat. No. 60,932), and four paratypes from Tucuman, Argentina, collected Oct. 11, 1925 by G. F. Moznette.

Other material.—In the U.S.N.M.: Argentina: 4 specimens from Santiago del Estero, collected April 13, 1940 by H. L. Parker, 6 specimens from Betania de Salta collected in a citrus grove May 13, 1927 by M. Kisliuk. In M.C.Z. in Bowditch collection: 1 specimen from Tucuman Prov. collected by C. Bruch, 1 from Jujuy, 2 from Catamarca Prov., C. Bruch, all these from Argentina. One specimen in collection F. Monros collected at Tarija on Rio Bermejo, Bolivia, Oct. 20, 1948 by A. Marlinez.

Remarks.—This is another species closely related to *M. vandepolli* Duv., but distinguished by the dark lateral vitta and the slightly differently shaped aedeagus. It is a paler species also, being yellow brown and not orange brown, and has brownish dark markings instead of black. As in the case of *M. melanoloma,* the median elytral spot is more elongate and less triangular, and in some specimens in a series from the same locality the median spot is lengthened to a vitta, which, however, does not extend to the base. So far specimens have been seen only from the northwestern part of Argentina and from Bolivia.

Megistops taurops n. sp.

(Plate 1, figure 5)

About 4 mm. in length, broadly oval, faintly shining, pale orange yellow above with deep brown to piceous head, undersurface and hind legs; anterior legs with basal half of femora dark; scutellum dark, elytra with a large dark median spot common to both elytra, a spot on the humerus and dark apex with the margin from apex to middle dark.

Head dark, eyes (in female) well separated on the occiput. Antennae with the first four joints pale, rest piceous, second joint fully as long as third, fourth twice as long. Prothorax approximately twice as wide as long at base, narrowed anteriorly and with thickened apical angles; surface not very shiny, granular, pale orange yellow with traces of five spots. Scutellum dark. Elytra granular with the surface sculpture a little smoother than the prothorax and very finely and substriately punctate; pale orange yellow with a piceous spot on the humerus and a large spot common to both elytra slightly below the middle, the apex broadly dark with the margin from the apex to the middle dark and widened into a lobe at the middle. Body beneath with the middle of the prothorax, breast and abdomen dark brown to piceous, hind legs also dark, anterior pairs of legs with the basal half of femora dark but rest paler, tarsi brown. Length 4 mm.; width 2.5 mm.

Type data.—Holotype female M.C.Z. Type No. 28,689. No locality label on the specimen but probably from South America.

Remarks.—Although no locality label is on the single female specimen, it is safe to say that this was collected in South America and probably in Brazil or southward. The specimen, which is included in Jacoby's second collection, now in the Bowditch collection, bears a label "Burchell collection". Burchell is known to have collected in South America. The markings on the humerus and apex resemble those of *M. vandepolli* Duv., but the large size and striking large spot on the middle of the elytra make it quite different in appearance. Possibly it is a color form of a four-spotted species. It is larger than any four-spotted species except *M. fenestrata* Illiger, which, unlike it, has a median vitta on the prothorax.

Megistops costaricensis n. sp.

(Plate 1, figure 1)

About 3.5 mm. in length, oval, moderately shiny, finely and densely punctate, pale yellow brown with deeper reddish brown mouthparts, dark outer joints to the antennae, pale brown undersurface and legs, and the elytra deep brown with four pale spots, the basal ones being more elongate and larger.

Head with eyes contiguous, a slightly produced carina extending from lower front with a few scattered punctures on it; mouthparts deeper in color. Antennae with the three basal joints paler than the distal ones, joints 2 and 3 about equal. Prothorax approximately twice as wide as long at base, narrowed apically, pale yellow with five indistinct spots, finely and densely punctate (granular), smoothly rounded but not very convex, and without depressions, basal margin sinuate. Scutellum small, deep brown. Elytra deep brown, almost piceous, each with an elongate pale basal spot curving outwards towards margin and larger than the apical spot, which curves irregularly from the margin to the suture; surface moderately shiny, granular. Body beneath deeper reddish brown, shining. Length 3.7 mm.; width 2 mm.

Type data.—Holotype, female and one paratype, female, U.S.N.M. Cat. No. 61,195. Taken on *Lippia berlandieri* Schauer, at San Pedro de Montes de Ora, Costa Rica, July 12, 1935, by Sofia Ballou.

Remarks.—This is the first species of *Megistops* to be taken on the North American continent, the species hitherto being known only from the West Indies and South America. The markings are similar to many other species, notably *M. pretiosus* Baly, from Venezuela, and *M. trinitatis* Bryant from Trinidad. *M. pretiosus* is described as having the thorax three times as broad as long, and Bryant describes *M. trinitatis* as being broader than *M. pretiosus*, so *M. costaricensis* is a more slender beetle than either of them.

INTERESTING NORTHERN RECORDS FOR EASTERN HYMENOPTERA (FORMICIDAE AND EMBOLEMIDAE). — On May 3, 1952, a mild, sunny day, Dr. W. L. Nutting, Dr. F. G. Werner and myself spent an afternoon collecting on Horn Pond Hill, near Winchester and Woburn, Massachusetts. This glaciated hill, low and largely denuded of its forest cover, bears many stones loosely set in the soil and providing excellent ant collecting. Under a large stone covering a nest of *Formica fusca* L., Werner discovered foraging workers of *Smithistruma* (*Wessonistruma*) *pergandei* (Emery); the nest of this ant was found under an adjoining rock. We secured most (perhaps 90%) of the population, which seemed unusually large for a dacetine nest, and a count yielded a total of 648 workers and 3 females (deälate queens). This is the largest population recorded for the nest of any dacetine species, and is more than twice the usual maximums recorded previously for this and other species. Previous northern records for *S. pergandei* are from nearby Boston and Cambridge, only a few miles farther south.

Beneath the rock covering the *S. pergandei* nest, but to one side, were found three workers of *Proceratium silaceum* Roger, of which the northeastern limit has been considered to rest in southern New York.

Under another rock overturned by Werner was found a female of the curious embolemid wasp, *Embolemus nearcticus* (Brues), previously known from Massachusetts (Stony Brook Reservation) and New York. This specimen is very similar to the types in the Museum of Comparative Zoology, but is darker and more brownish in color. It was found crawling on the under side of the rock. It is interesting to note that all the records for this insect are dated in May. The host is unknown. — W. L. BROWN, JR., Museum of Comparative Zoology, Harvard University.

THE FEMALE OF *FORMICA OPACIVENTRIS* EMERY (FORMICIDAE)

By Robert E. Gregg
Department of Biology, University of Colorado

The forms of *Formica exsecta* constitute a small, well defined group of ants easily recognized by the excavated, or broadly emarginate, occipital border of the head. Only three of the North American variants are now considered valid (Creighton, 1950, for synonymy). All the castes of *Formica exsectoides* and *F. ulkei* have been described previously, but the worker and male alone were the castes hitherto known for *F. opaciventris*, the female having escaped collection. I am now able, however, to fill this gap by presentation of the description of the *opaciventris* queen.

Dr. Creighton cites the mountains of Colorado and Wyoming as the range of this species, and states that it appears to be confined to high intermountain valleys, and does not occur on the eastern slope of the Rockies. The nests he observed were built in hard, stony soil, and consequently differed much from the nests of the eastern *exsectoides* and *ulkei* which are usually in moist, spongy earth.

Near the village of Valmont, Colorado, five miles east of Boulder, is an assemblage of mound nests of *Formica* readily visible from the road. The nests are in a low, moist meadow at approximately 5160 feet, and partly arranged with reference to the water table in that most of them are present on slightly higher ground and fewer are in the swales where alkali accumulates from the evaporation of water.

These mounds are occupied largely by *Formica altipetens*, but some are constructed by *opaciventris*. With Dr. Creighton, I visited the area on November 29, 1950, and by careful excavation of one of the nests, we discovered the single deälated female of *Formica opaciventris*. This was much better luck than we had any right to expect, especially in view of the fact that it was the first nest completely dug into, and also that no other queens were taken from the colony. Though we tried other nests, no further specimens of females of this species were obtained, and no winged forms, male or female, were found either. The queen was brought to the laboratory and kept in an observation nest for four months (until April 2, 1951), after which she was preserved. During the period, a few eggs were laid but only three workers were reared to maturity, and these were all much smaller than the workers from the original colony which were brought with the queen and kept with her in the artificial nest. No positive information was gleaned regarding the species of ant which serves as host for the incipient colonies of *opaciventris*, but it seems probable that *altipetens* may function in this capacity, owing to the fact that so many nests of the latter were present in the pasture where the *opaciventris* colonies were found. We did not turn up any incipient nests of the parasitic species, nor did we find any mixed colonies of the two ants, though we searched for them. It has never been established that *opaciventris* is truly a temporary social parasite, and its host is still unknown; however, it has been shown that *exsectoides* and *ulkei* both utilize *F. fusca*, so it will be no surprise if *opaciventris* is found eventually to use *fusca* or some related species. The well developed trichomes, or brushes of short hairs, on the mesonotum of the queen are strong evidence in favor of such a prediction.

Formica opaciventris Emery

Female: — Length 10.5 mm.; head index 0.96.

Head subquadrate, almost as wide as long; sides straight but distinctly converging anteriorly; greatest width occurs just behind the eyes; occipital border broadly and definitely excised. Clypeus entire, with only a slight point at the middle of the anterior margin, and an indistinct carina. Frontal area well defined and triangular. Antennal scapes slender though gradually increasing in thickness toward the tips, and surpassing the occipital angles by a distance equal to about ⅓ of their lengths. Eyes of the usual shape (oval), rather flat, and situated posterior to the middle of the head. Mandibles triangular, with 5 to 6 more or less distinct teeth, and no denticles along the basal border. Frontal carinae short (about twice as long as the diameter of the antennal fossae), straight, and strongly divergent. Ocelli distinct.

Thorax somewhat narrower than the head, dorsum almost flat in profile. Scutum broadly egg-shaped with prominent parapsidal furrows; scutellar sclerites well developed laterally, obsolete medially; postscutellum trapezoidal, moderately elevated above the metanotum. Epinotum rounded dorsally and laterally; basal face short and the declivity long and sloping, with the angle between them indistinct, indicated only by the greatest convexity of the epinotal profile. Petiolar scale extremely broad with straight sides, giving it a decidedly quadrate appearance, especially when viewed from the front; slightly convex anteriorly and flat posteriorly; superior border sharp, faintly emarginate in the middle, and expanded into small spatulate lobes at the upper corners of the scale. Spiracular openings on the petiole form prominent denticles on the sides near the base of the scale. Wings are absent on the specimen, but ragged fragments of the bases of both anterior wings and the left posterior wing present. Abdomen oval and of the usual formicine shape.

Head opaque, except the frontal area and corners of the clypeus which are somewhat smooth and shining. Mandibles striated but otherwise shining. Thorax subopaque, rather faintly shining on the mesonotum and near the sutures. Petiole and gaster subopaque, the surfaces less heavily shagreened so that their shiny appearance is not completely obscured.

Erect hairs present on the frons, clypeus, vertex, mandibles, top of pro-, meso-, and metanotum, posterior face and peduncle of the petiole, anterior margin of gaster, venter, dorsum of last three gastric segments, coxae, and a very few on the femora. Tibiae with graduated bristles on the flexor surfaces. The scutellum has on each side a trichome of short, curved, golden hairs distinct from the other more scattered hairs on the thorax. Hairs absent on the gula, occiput, antennal scapes, thoracic pleurae, and most of the dorsum of the first two gastric segments. All hairs are golden yellow, coarse, irregular in length, and blunt but not spatulate. A few, short scattered hairs occur on the eyes. Pubescence dilute.

Color of head, most of thorax, petiole, base of gaster, and the legs ferruginous red, mandibles darker red. Ocellar triangle, postscutellum, and metanotum deeply infuscated. Gaster infuscated except at base, becoming dark brown to black toward the tip. Wings, as far as can be seen from the broken basal pieces, straw-colored.

Gynetype: one deälated female (Queen of a mature colony). Collection of R. E. Gregg.

Direct comparison with eleven females of *F. ulkei* in the collection of the author (three of which retain wings), showed that this species may be distinguished from the queen of *opaciventris* by a slightly more quadrate head (head index of 1.0), the postscutellum faintly more concave in profile, the scale of the petiole more convex along its superior border and tapering to a narrower base where it attaches to the peduncle, hairs very much longer, more abundant and curly on the thorax and petiole, and sculpture weak, leaving the head, thorax, and abdomen very shining. In color, *ulkei* shows the posterior one-half to two-thirds of the head very dark brown to black, with the anterior portion yellowish red, the promesonotal suture darkened, longitudinal stripes of infuscation on the scutum, mesopleurae and a spot on the propleurae dark brown, infuscation of the postscutellum confined to the posterior margin, and the gaster concolorous without a basal patch of red.

Two winged females of *exsectoides* also available for study made possible the following comparisons. The female of *opaciventris* differs from that of *exsectoides* in having distinctly more dilute gastric pubescence, long hairs on the anterior margin of the first segment of the gaster and on the petiolar scale, shorter but much more numerous hairs on the thorax, and hairs on the lower angle of the pronotum and on all coxae. The distinct scutellar trichomes of *opaciventris* are lacking on my specimens of *exsectoides*, but this cannot be assumed to be the result of rubbing and old age, for the youth of these females is attested by their retention of wings. Wheeler (1913) alludes to small tufts of flexuous hairs on the mesonotum in his description of the queen of *exsectoides* but does not definitely state that they are trichomes. He also states that the color is like that of the worker, being deep red, with the gaster black and the mandibles, legs, vertex, funiculi, and dorsal portions of the thorax sometimes brownish or dark red. One of my specimens of *exsectoides* has no infuscation of the head or thorax except on the vertex, while the other female is heavily infuscated on all parts. Any minor color differences, therefore, which exist between *exsectoides* and *opaciventris* probably should be regarded as inconsequential. Finally, the scale on the petiole of *opaciventris* has spatulate corners, but there is no such trait in *exsectoides* typicus.

A worker and a female of the ant *exsectoides* var. *davisi* Wheeler (1913), labeled "cotype", have also been examined, and I am in agreement with Creighton that this form is a synonym of the eastern *exsectoides*. The only detectable differences between these insects are that the *davisi* female has somewhat shorter hairs and is practically devoid of gastric pubescence.

Wheeler further described the variation *hesperia* from diminutive workers, and Creighton has recently invalidated it too. A cotype worker of this ant (in the Creighton collection), checked against specimens of *exsectoides* which I have from Illinois and New York, showed the ant to be almost identical with the small workers of the typical species, particularly with respect to color, hair pattern, and shape and size of the petiolar scale. The scale is not like that of *F. dakotensis*, as contended by Wheeler, but has rather a sharp, elevated, and evenly curved superior border. Dr. Creighton (1950, p. 514), seems to be quite justified in submerging *hesperia* as a synonym of *exsectoides*. The sole difference I could find between the two is an insignificantly broader head with slightly shallower occipital emargination, but this is the sort of variation one would expect to find even in a nest series of *exsectoides*. It must be remembered that the types of the supposed *hesperia* came from Colorado Springs.

To return to the species of greatest concern in this paper, Creighton believes that *opaciventris* should stand as a well defined form and not as a subspecies of *exsectoides* where it was placed by Wheeler in 1913. Emery had originally described it as a variety of the same in 1893. Creighton's treatment may be the wiser, but from the descriptions of differences among the females as noted above, and the workers which also differ only in the greater pilosity of *opaciventris*, it may be necessary to return to Wheeler's proposal. The differences enumerated, at best, seem to be rather slight, hence it would appear possible to consider the two ants as very closely related with *opaciventris* a subspecies of *exsectoides*. Moreover, the ranges of these insects, though heretofore regarded as far apart, actually overlap, but the degree of overlap is at present very uncertain. Creighton gives Nova Scotia to Georgia and west to Wisconsin and Iowa as the territory of *exsectoides*, while *opaciventris* is a Rocky Mountain form. Specimens of both of these species are present in my collections from the vicinity of Boulder, Colorado, the former from foothills at about 7500 feet, and the latter from the plains at slightly over 5000 feet. Thus we have to revise westward our conception of the range of *exsectoides*, and the range of *opaciventris* is now known to extend to lower altitudes and perhaps eastward on the plains. It may be found, when more material is gathered, that the two forms intergrade, and if so they will have to be classed as subspecies.

Formica ulkei should stand alone as a distinct species. The ranges of *ulkei* and *exsectoides* are known to overlap in northern Illinois and Indiana, southern Wisconsin, and Iowa, but the ants remain morphologically distinct even though the nests of each are practically identical in appearance. I have specimens of *ulkei* and *exsectoides* collected within a few hundred feet of each other at Palos Park, Illinois, and there is not the faintest indication of intergradation. In the case of these two species, then, we have nothing to show that one could be a subspecies of the other. *F. ulkei* is a boreal form whose main range is in the northern tier of states and southern Canada.

LITERATURE CITED

CREIGHTON, W. S.

1950. The ants of North America. Bull Mus. Comp. Zool., 104:1-585.

EMERY, C.

1893. Beiträge zur Kenntnis der nordamerikanischen Ameisen-fauna. Zool. Jahrb. Syst., 7:633-682.

WHEELER, W. M.

1913. A revision of the ants of the genus *Formica*. Bull. Mus. Comp. Zool., 53:379-565.

CORRECTION TO THE SYNONYMY OF THE ANT CAMPONOTUS FORMOSENSIS WHEELER.—In a joint paper (Yasumatsu and Brown, 1951, Jour. Fac. Agr., Univ. Kyushu, 10, cf. p. 42), the synonymy of *Camponotus formosensis* is cited incorrectly. Due to an unfortunate clerical error, the name *Camponotus maculatus taylori* var. *formosae* Wheeler and the variant nomenclatorial equivalents *C. barbatus albosparsa* var. *formosae*, Emery and *C. barbatus taylori* var. *formosae*, Teranishi were wrongly included in this formal list of synonyms and must now be removed. The variety *formosae*, whatever may be its relationship to *maculatus* or *barbatus*, is of course not at all closely related to *C. formosensis* or any other member of the *C. herculeanus* group.—W. L. BROWN, JR., Museum of Comparative Zoology, Harvard University.

A NEW GENUS AND SPECIES OF ISOTOMIDAE (COLLEMBOLA)[1]

By Peter F. Bellinger
Osborn Zoological Laboratory, Yale University

In the course of an investigation of the soil fauna of some localities in Connecticut[2], a number of species of Collembola were found which do not appear to have been described. One of these is the subject of the present paper. Others will be dealt with in future contributions, as sufficient material becomes available.

Micrisotoma, gen. nov.

Vestiture generally of short simple setae; a few curved, strongly serrate setae on all body segments, and some long simple setae on the last tergite. Fourth antennal segment with blunt, cylindrical sensory hairs dorsally. Postantennal organ broadly oval, with a thick border divided into equal arcs by four fine partitions. Eyes absent. Unguis and empodial appendage untoothed. Tibiotarsus with a distal subsegment defined by an indistinct suture. Tenent hairs absent. Fifth and sixth abdominal segments ankylosed. Manubrium with two pairs of setae ventrally. Dentes dorsally crenulate. Mucro bidentate. Pigment absent.

Generotype: *M. achromata,* sp. nov.

Micrisotoma achromata, sp. nov.

(Plate 2)

Numerous short, simple, curved setae on the head, tergites, and appendages. Outstanding, curved, serrate setae

---

[1] Published with a grant from the Museum of Comparative Zoology at Harvard College.

[2] Carried out with financial assistance from the Connecticut Agricultural Experiment Station.

are distributed as follows: one on each side of each thoracic tergite; one on the base of the prothoracic leg; two to five on the bases of the mesothoracic and metathoracic legs; two or more pairs on each abdominal tergite, becoming more numerous posteriorly. These setae (fig. 6) bear a small number of strong, well spaced teeth.

The characteristic vestiture of the fused fifth and sixth abdominal segments is as follows (fig. 8): mixed simple and serrate setae in a line at the anterior border of the tergite, and at the sides posteriorly; dorsally, behind this line, a straight transverse row of eight long, straight, simple, blunt-tipped setae (fig. 7); behind this row five similar setae in a W-shaped line, two anterior and three posterior; along the posterior margin a straight row of five long, straight, simple, sharp-pointed setae. Among the first two rows are scattered a number of very fine hairs; two additional fine hairs, of which the anterior is minute, are just inside and in front of each of the two lateral blunt setae of the third row. On each side of the tergite, in the first row, is a short, broad sensory hair.

Antenna slightly longer than head; relative length of segments (expanded) 2:3:3:6. Fourth segment (fig. 1) enlarged, oval, ending in a blunt cone; dorsally with a number of blunt, cylindrical sensory hairs. Sense organ of third antennal segment with two short, curved rods directed anteromediad, and two adjacent guard hairs, the ventral one straight, the dorsal curved and somewhat posterior to the rods.

Postantennal organ (figs. 2, 3) longer than the greatest width of the second antennal segment (about 5:4), broadly oval with a border about ⅓ of its greatest diameter in width; this border is interrupted at each end, and midway on each side, by fine partitions. Eyes absent.

Unguis (fig. 4) moderate in length, curved, untoothed. Empodial appendage three-winged, more or less triangular with acuminate apex; about ½ length of unguis. Tenent hairs absent. Tibiotarsus with an incomplete distal subsegment; the suture is evident only ventrally.

Ventral tube with about eight ventral setae. Rami of tenaculum quadridentate; corpus with one seta.

Manubrium ventrally with two pairs of strong setae near the distal margin. Dens twice length of manubrium; dorsally crenulate in the middle third only, with about 16 folds; bearing a few fine setae dorsally and many ventrally. Mucro (fig. 5) bidentate, the apical tooth much the larger and strongly curved; a medial lamella runs to the tip of the proximal tooth.

Fifth and sixth abdominal segments wholly ankylosed. Female genital opening a transverse slit, with anterior and posterior lips each bearing a pair of setae. Male genital opening not seen.

Pigment wholly absent, except for the amber-colored mouth parts.

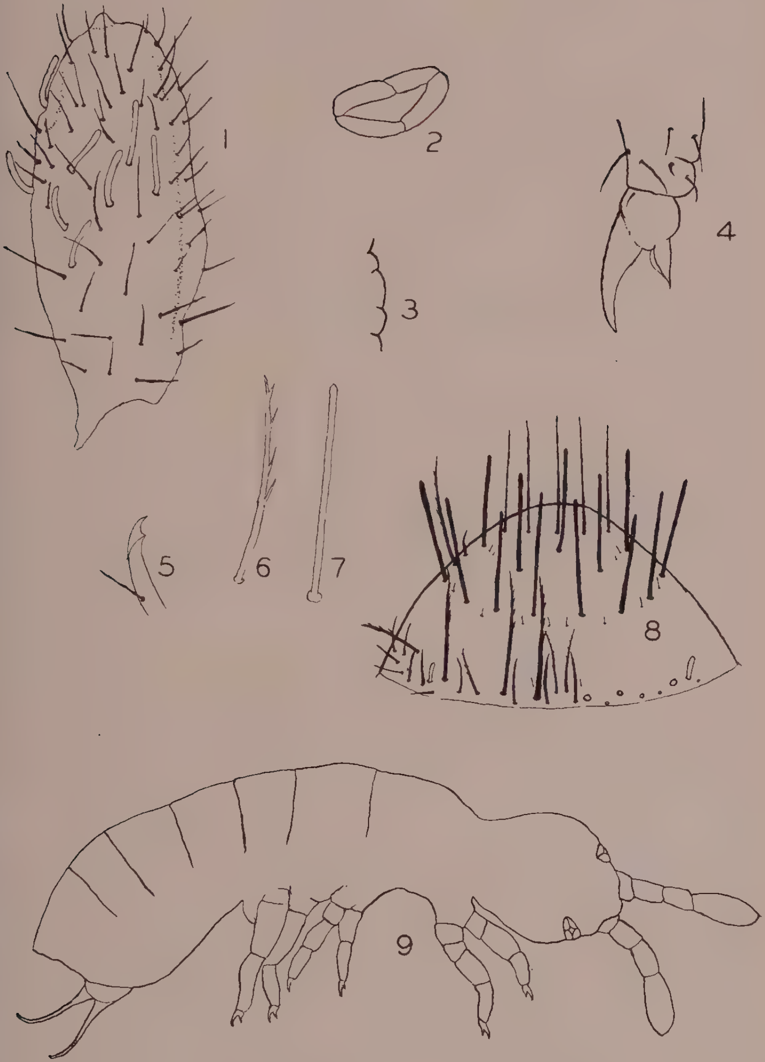
Length of holotype 0.65 mm. Range (12 specimens) 0.4 to 0.75 mm. The relative proportions of the segments may be judged from fig. 9; unfortunately specimens tend to be somewhat distorted in mounting, and the normal proportions cannot be determined.

The number of sensory hairs on the fourth antennal segment varies from eight to eleven. The number of serrate setae varies somewhat also, but these are easily detached and part of the variation may be apparent only. In one specimen one ramus of the tenaculum is quinquedentate.

Holotype: "Cathedral Pines", Cornwall, Litchfield Co.,

EXPLANATION OF PLATE 2

Micrisotoma achromata. Magnifications approximate. Fig. 1. Dorsal view of left fourth antennal segment, holotype (700 X). Fig. 2. Right postantennal organ, partype (700 X). Fig. 3. Right postantennal organ. paratype, transverse optical section (700 X). Fig. 4. Left hind claw and distal part of tibiotarsus, holotype (700 X). Fig. 5. Left mucro and end of dens, paratype (700 X). Fig. 6. Serrate seta from second abdominal segment, holotype (700 X). Fig. 7. Blunt seta from sixth abdominal segment, holotype (700 X). Fig. 8. Fused fifth and sixth abdominal segments showing arrangement of setae; somewhat diagrammatic (350 X). Fig. 9. Holotype; outline, setae omitted. (120 X).



BELLINGER — ISOTOMIDAE

Connecticut; taken in humus in a mature white pine-hemlock stand, 19 December 1950.

Paratypes: same locality, October and December 1950; February, May, and August 1951. Eleven specimens.

Also taken once in humus under cedars in the outer zone of an acid bog, Bethany, New Haven Co., Connecticut.

The holotype will be deposited in the Museum of Comparative Zoology, Harvard University. One paratype will be sent to the California Academy of Sciences, San Francisco, Calif., and one to the United States National Museum, Washington, D. C. The remaining paratypes are in the author's collection.

Micrisotoma cannot be distinguished from other genera of Isotomidae by any single character. The form of the postantennal organ will distinguish it from other isotomids in the holarctic region, but *Isotomina interrupta* Schott, from Cameroons, is said to have a similar organ (Stach 1947; the original description is not available to me), and some species of *Proisotoma* approach it in this respect (Folsom 1937, figs. 245, 246, and 273). The subsegmented tibiotarsus allies it to *Proisotoma* Börner, and the fused abdominal segments and absence of eyes to *Proisotomina* Salmon; from both genera it is distinguished by the presence of serrate setae. In vestiture and general appearance it resembles *Isotomiella* Bagnall, which, however, lacks a postantennal organ.

Micrisotoma achromata appears to be relatively uncommon in the two situations in which it has been found so far. It is possible that it is a marginal species in these areas, and that its environmental optimum is somewhat different. The species has not been seen alive; specimens in alcohol are indistinguishable from *Isotomiella minor* Schaffer, which is common in the same samples.

BIBLIOGRAPHY

FOLSOM, J. W.

1937. Nearctic Collembola or Springtails, of the Family Isotomidae. U. S. Nat. Mus. Bull. 168.

SALMON, J. T.

1948. Collembola from the Three Kings Islands with a description of *Proisotomina*, new genus. Rec. Aukland Inst. Mus., 3:291-300.

STACH, J.

1947. The apterygotan fauna of Poland in relation to the world fauna of this group of insects. Family Isotomidae. Acta Monogr. Mus. Hist. Nat., Polish Acad. Sci. Letters.

MYSTRIUM IN AUSTRALIA (HYMENOPTERA: FORMICIDAE). On July 8, 1951, in the company of Mr. William Bateman, Forest Officer for the Northern Territory of Australia, I collected three workers of *Mystrium camillae* Emery at the Howard River, north of Howard Springs, Northern Territory. This locality, southeast of Darwin, bears vegetation of the type known as "tall open monsoon forest," made up of the co-dominant trees *Eucalyptus miniata* and *E. tetradonta*, with cycads and various tall grasses conspicuous in the understories. The ants were found beneath a dry log very close to a termite colony. They lay feigning death for at least thirty seconds before being put into alcohol.

The particular log from which the collection was made lay near, but not within, gallery forest of the type common along watercourses in the Darwin area. In such forest are found many species of Indomalayan trees growing close to the permanent moisture; these belong to such widespread genera as *Terminalia, Pandanus,* etc., and are intermingled with large specimens of the paperbark, *Melaleuca leucodendron*. (I am grateful to Mr. Bateman for the botanical information here greatly condensed.) This is the first time the genus *Mystrium* has been taken in the Australian region. *M. camillae* has been taken at several points in southeastern Asia, from Burma through the East Indies and the Philippines, and is the sole species found in this area. Several closely related species of the *M. mysticum* group occur on Madagascar.—WILLIAM L. BROWN, JR., Museum of Comparative Zoology, Harvard University.

NOTES ON SOME OF OSBORN'S MALLOPHAGA TYPES AND THE DESCRIPTION OF A NEW GENUS, *ROTUNDICEPS* (PHILOPTERIDAE)[1]

By Robert L. Edwards
Biological Laboratories, Brandeis University

There is a small series of Herbert Osborn's Mallophaga types, comprising nine species, in the Museum of Comparative Zoology. These were described as new in his 1896 paper, *Insects Affecting Domestic Animals.*[2] I should like to express my indebtedness to the late Mr. James E. Peters, Curator of Birds, Museum of Comparative Zoology, who permitted me on numerous occasions to examine bird skins for lice to help determine the validity of host designations, and to Dr. Joseph Bequaert, Curator of Insects, for the loan of the type material. Mr. Louis Lipovsky, Department of Entomology, University of Kansas, supplied me with additional material. Dr. K. C. Emerson has given me many valuable suggestions concerning the material. A grant-in-aid from the Society of the Sigma Xi made it possible for me to complete this study.

The Osborn types are mounted on roughly cut thick glass slides, and many of them have cover glasses of the same material. The insects are in relatively good condition, although only partially cleared, and are undoubtedly those referred to in the descriptions. The type catalog numbers are contained in parentheses with the initials (MCZ).

Penenirmus tyrannus (Osborn)

Nirmus tyrannus Osborn, 1896, p. 228.

One slide with two females in fairly good condition (MCZ 27341).

---

[1] Published with a grant from the Museum of Comparative Zoology at Harvard College.

[2] 1896. U.S.D.A. Bull., No. 5 (N.S.).

Type host: *Tyrannus tyrannus* (Linn.), the Eastern Kingbird.

Philopterus fusco-ventralis (Osborn)

Docophorus fusco-ventralis Osborn, 1896, pp. 221-222.

Two slides containing seven adults and three immatures in good condition (MCZ 27342).

Type host: *Contopus virens* (Linn.), the Eastern Wood Pewee.

Philopterus osborni, nom. nov.

Docophorus corvi Osborn, 1896, pp. 220-221.

Three slides containing five adults and three immatures in good condition although uncleared. Since Clay and Hopkins[3] have designated *Philopterus corvi* as the correct name for *Pediculus corvi* Linn. from *Corvus c. corax* Linn., Osborn's name must fall as a homonym (MCZ 27344).

Type host: *Corvus brachyrhynchus* Brehm, the Crow.

Quadraceps boephilus (Kellogg)

Nirmus boephilus Kellogg, 1896, New Mallophaga I, pp. 107-109.

Nirmus parallelus Osborn, 1896, pp. 229-230.

Three females on one slide, in good condition (MCZ 27336).

Type host: *Charadrius vociferus* Linn., the Killdeer.

Picicola marginatulus (Harrison)

Nirmus marginatus Osborn, 1896, p. 228.

Degeeriella marginatulus Harrison 1916, Parasitology 9, p. 117. Nomen novum.

One slide with three adult females in good condition (MCZ 27339).

Type host: *Dryocopus pileatus* (Linn.), the Pileated Woodpecker.

---

[3] 1950. The Early Literature on Mallophaga. Bull. Brit. Mus. (Nat. Hist.), Ent. Ser., 1(3): 231-233, figs. 6-9.

Picicola orpheus (Osborn)

Nirmus orpheus Osborn 1896, pp. 227-228.

One slide containing two males, both of which are apparently terminating their last instar or are very recently adult. Dr. K. C. Emerson believes that they are possibly members of the genus *Lagopoecus,* while I believe they are more closely related to *Picicola* (as does Miss T. Clay, personal communication). This species is particularly difficult to determine since Osborn's host reference, *Galeoscoptes carolinensis,* presently *Dumatella carolinensis* (Linn.) is apparently incorrect. The genitalia certainly show affinities with *Picicola.* This species must remain an enigma until additional material is obtained. (MCZ 27340).

Type host: Yet to be determined, probably a woodpecker.

Bruelia abruptus (Osborn)

Nirmus abruptus Osborn, 1896, p. 229.

One adult female and an immature in good condition (MCZ 27338).

Type host: Unknown. The reference to *Colinus virginianus* (Linn.) is almost certainly incorrect. The louse has, in all probability, a passeriform host.

Rotundiceps gen. nov.

(Plate 3)

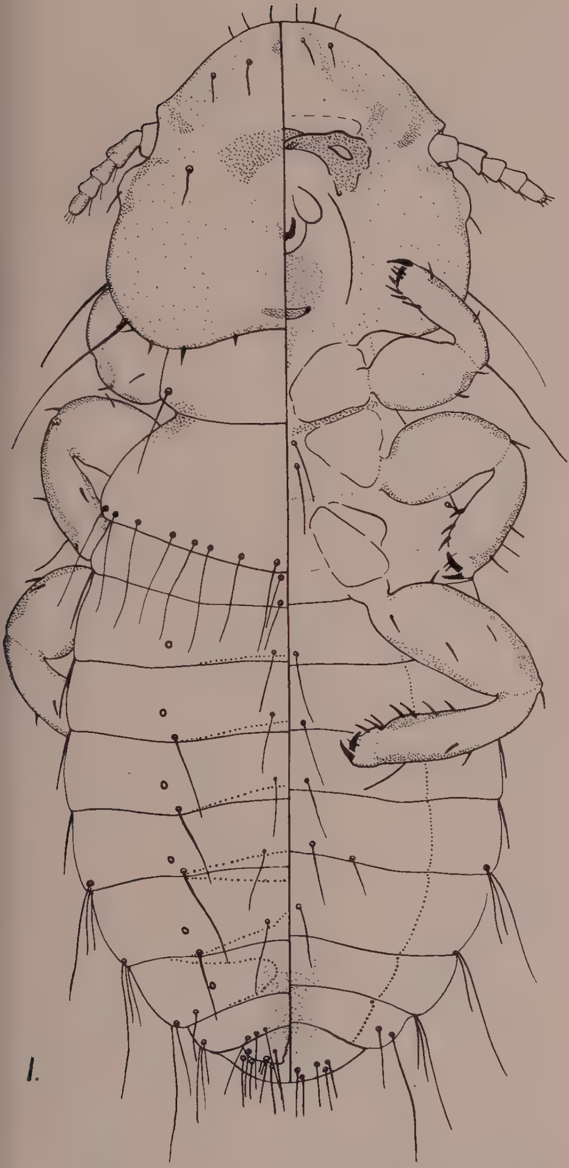
The genus is described for Osborn's *Nirmus cordatus.* It is closely related to *Lunaceps,* and is another example of ecological adaptation, *Lunaceps* frequenting the wings and back of the host while *Rotundiceps* is usually found about the head.

Description: Head broadly rounded, slightly broader than long, only slightly buttressed marginally. Relatively strongly buttressed around the bases of the antennae and mandibular articulations. Signature only barely repre-

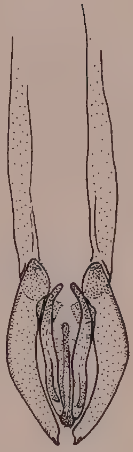
---

Explanation of Plate 3

Fig. 1. Dorso-ventral view of male *Rotundiceps cordatus* Osborn.
Fig. 2. Male genitalia.



1.



2.

EDWARDS — MALLOPHAGA

sented by small irregular sclerotized area. Posterior margin of head armed with short, stout setae. Rounded, lightly sclerotized gular area. Posterior margin of pterothorax with complete although irregular row of long setae. Abdomen slightly longer than broad, lightly sclerotized without obvious delineation of tergites and sternites. Spiracles six, on morphological segments 3-8. Mid-dorsal and mid-ventral double rows of setae on proximal seven segments. All spiracles except first and last with long seta posterior to each on border of tergite. In male, the first six tergites narrowed medially, with seventh separated into two parts, the eighth complete. Male genital opening dorso-terminal.

Genotype: *Nirmus cordatus* Osborn.

Type host: *Limosa fedoa* (Linn.), the Marbled Godwit. Although Osborn lists *L. haemastica* as the host in his text, I have failed to find any specimens in many collections from this bird. Collections from *L. fedoa* however contain abundant specimens of this louse. The type slide (MCZ 27337) label lists the host as *Limosa hudsonica*.

Rhynonirmus infuscatus (Osborn)

Lipeurus infuscatus Osborn, 1896, pp. 234-235.

The type material consists of three slides as follows: No. 340 with an adult female *Lunaceps;* No. 314 with an adult female *Rhynonirmus;* and No. 334 with two adult males, *Rhynonirmus,* from *Bartramia longicauda* (Bechstein). The male specimen centrally located in slide No. 334 is hereby designated as the lectotype (MCZ 27343).

Type host: *Bartramia longicauda,* the Upland Plover. The louse has been taken commonly from his host. Contrarywise, I failed to locate it in several collections from *Philohela minor* (Gmelin).

LECTOTYPES OF HAGEN SPECIES BELONGING TO CERTAIN FAMILIES OF TRICHOPTERA[1]

By Herbert H. Ross
Illinois Natural History Survey, Urbana

During the course of study of the Hagen material belonging to the primitive families of Trichoptera it appeared desirable to designate lectotypes of those species represented by a type series. This material is in the collection of the Museum of Comparative Zoology at Harvard University, Cambridge, Massachusetts. Lectotype specimens have been so labelled. In addition to these, a few unique types have been recorded here for convenience.

The species treated belong primarily to the families Philopotamidae, Psychomyiidae, Hydropsychidae and Rhyacophilidae, plus one or two in other families. The species are listed alphabetically, first by the genus in which they were originally described, then by the species names given by Hagen. In certain genera such as *Macronema,* Hagen included species of great taxonomic diversity; for clarity all species described by Hagen in such genera are treated here.

In addition to the labels indicated the specimens noted bear also the Hagen Collection label. The English translation of the label is given.

Agapetus rudis Hagen

1859. Verh. K.K. zool.-bot. Ges. Wien, 9:211.
Data in original description: Rambodde, Ceylon, Nietner coll.
Lectotype male: Ceylon, Nietner, M.C.Z. Type No. 11086.

---

[1] This study was aided by a research grant from the John Simon Guggenheim Memorial Foundation and published with a grant from the Museum of Comparative Zoology at Harvard College.

Aphelocheira meridionalis Hagen

1864. Ann. Soc. Ent. France, ser. 4, 4:44. ♂.
Data in original description: Corsica (inferred from title).
Lectotype male: Corsica, B. Ch., M.C.Z. Type No. 11056.

Chimarrha auriceps Hagen

1858. Verh. K.K. zool.-bot. Ges. Wien, 8:486.
Data in original description: Rambodde, Ceylon, Nietner coll.
Lectotype male: Ceylon, Nietner, M.C.Z. Type No. 11094.

Chimarrha circularis Hagen

1859. Verh. K.K. zool.-bot. Ges. Wien, 9:210.
Data in original description: Rambodde, Ceylon, Nietner coll.
Lectotype male: Ceylon, Nietner, M.C.Z. Type No. 11095.

Chimarrha funesta Hagen

1858. Verh. K.K. zool.-bot. Ges. Wien, 8:486.
Data in original description: Rambodde, Ceylon, Nietner coll.
Lectotype male: Ceylon, Nietner, M.C.Z. Type No. 11097.

This species belongs in the family Psychomyiidae and perhaps in the genus *Pseudoneureclipsis* Ulmer.

Chimarrha pulchra Hagen

1861. Synopsis Neur. N. Amer. :298.
Data in original description: Cuba (Poey, Osten Sacken).
Lectotype female: Cuba, March 1858, O. Sacken, M.C.Z. Type No. 11100.

Chimarrha sepulcralis Hagen

1858. Verh. K.K. zool.-bot. Ges. Wien, 8:486.
Data in original description: Rambodde, Ceylon, Nietner coll.
Lectotype male: Ceylon, Nietner, M.C.Z. Type No. 11096.

Hydropsyche (?) *bivittata* Hagen

1861. Synopsis Neur. N. Amer. :291.
Data in original description: Panama.
Lectotype female: Panama, M.C.Z. Type No. 11019.

A member of the genus *Smicridea,* closely allied to *fasciatella* McL.

Hydropsyche maderensis Hagen

1865. Stettiner Ent. Ztg., 26:219.
Data in original description: Madeira.
Lectotype male: Madeira, 1852, M.C.Z. Type No. 22182.

Hydropsyche maligna Hagen

1859. Verh. K.K. zool.-bot. Ges. Wien, 9:211.
Data in original description: Rambodde, Ceylon, Nietner coll.
Lectotype male: Ceylon, Nietner, M.C.Z. Type No. 11023.

Hydropsyche mitis Hagen

1858. Verh. K.K. zool.-bot. Ges. Wien, 8:487.
Data in original description: Rambodde, Ceylon, Nietner coll.
Lectotype male: Ceylon, Nietner, M.C.Z. Type No. 11024.

This species belongs to the genus *Tinodes* (see under *Polycentropus* ? *rufus* below).

Hydropsyche papilionacea Hagen

1859. Verh. K.K. zool.-bot. Ges. Wien, 9:211.
Data in original description: Rambodde, Ceylon, Nietner coll.
Lectotype male: Ceylon, Nietner, M.C.Z. Type No. 11022.

Hydropsyche taprobanes Hagen

1858. Verh. K.K. zool.-bot. Ges. Wien, 8:487.
Data in original description: Rambodde, Ceylon, Nietner coll.
Lectotype male: Ceylon, Nietner, M.C.Z. Type No. 11021.

Hydroptila cursitans Hagen

1859. Verh. K.K. zool.-bot. Ges. Wien, 9:209.
Data in original description: Rambodde, Ceylon, Nietner coll.; common.
Lectotype male: Ceylon, Nietner, M.C.Z. Type No. 11106. Made the genotype of *Plethus* Hagen.

Macronema aeneum Hagen

1861. Synopsis Neur. N. Amer.: 285.
Data in original description: Mexico (Sallé).
Type female: Sallé, V.C., M.C.Z. Type No. 10992. Probably a member of the genus *Notiomyia*.

Macronema annulicorne Hagen

1858. Verh. K.K. zool.-bot. Ges. Wien, 8:485.
Data in original description: Rambodde, Ceylon, Nietner coll.
Lectotype male: Ceylon, Nietner, M.C.Z. Type No. 10990. Placed in *Anisocentropus* by Ulmer.

Macronema ceylanicum Hagen

1858. Verh. K.K. zool.-bot. Ges. Wien, 8:485.
Data in original description: Rambodde, Ceylon, Nietner coll.
Lectotype male: Ceylon, Nietner, M.C.Z. Type No. 11031. The type of the genus *Pseudoleptonema* Mosely.

Macronema chalybeum Hagen

1861. Synopsis Neur. N. Amer. :285.
Data in original description: Cuba (Poey).
Lectotype male: Cuba, 1864, Poey, M.C.Z. Type No. 10991. Now considered a member of the genus *Phylloicus* Müller.

Macronema nebulosum Hagen

1858. Verh. K.K. zool.-bot. Ges. Wien, 8:485.
Data in original description: Rambodde, Ceylon, Nietner coll.
Lectotype male: Ceylon, Nietner, M.C.Z. Type No. 11030.

Macronema obliquum Hagen

1858. Verh. K.K. zool.-bot. Ges. Wien, 8:485.
Data in original description: Rambodde, Ceylon, Nietner coll.
Lectotype male: Ceylon, Nietner, M.C.Z. Type No. 11033.

Macronema sepultum Hagen

1859. Verh. K.K. zool.-bot. Ges. Wien, 9:209.
Data in original description: Rambodde, Ceylon, Nietner coll.
Lectotype male: Ceylon, Nietner, M.C.Z. Type No. 11032.

Macronema splendidum Hagen

1858. Verh. K.K. zool.-bot. Ges. Wien, 8:484.
Data in original description: Rambodde, Ceylon, Nietner coll.
Lectotype male: Ceylon, Nietner, M.C.Z. Type No. 11029.

Macronema vitrinum Hagen

1859. Verh. K.K. zool.-bot. Ges. Wien, 9:209.
Data in original description: a single male, Rambodde, Ceylon, Nietner coll.
Type male: Ceylon, Nietner, M.C.Z. Type No. 11025.

Notibodia lutea Hagen

1861. Synopsis Neur. N. Amer. :271.
Data in original description: St. Domingo.
Lectotype female: St. Domingo, Winthem, M.C.Z. Type No. 10940.

A member of the genus *Helicopsyche.*

Philopotamus flavidus Hagen

1864. Ann. Soc. Ent. France, ser. 4, 4:44.
Data in original description: Corsica.
Lectotype male: Corsica, B. Ch., M.C.Z. Type No. 11061.

Philopotamus siculus Hagen

1860. Stettiner Ent. Ztg., 21:278.

Data in original description: 2 females from Messina, end of March.

Lectotype female: Messina, May 30, 1844, M.C.Z. Type No. 11059.

Polycentropus nubigenus Hagen

1859. Verh. K.K. zool.-bot. Ges. Wien, 9:211.

Data in original description: Rambodde, Ceylon, Nietner coll.

Lectotype male: Ceylon, Nietner, M.C.Z. Type No. 11034.

Polycentropus ? *rufus* Hagen

1859. Verh. K.K. zool.-bot. Ges. Wien, 9:211.

Data in original description: Rambodde, Ceylon, Nietner coll.

Lectotype male: Ceylon, Nietner, M.C.Z. Type No. 11035. This species is a synonym of *Tinodes mitis* (Hagen).

Rhyacophila castanea Hagen

1858. Verh. K.K. zool.-bot. Ges. Wien, 8:487.

Data in original description: Rambodde, Ceylon, Nietner coll.

Lectotype male: Ceylon, Nietner, M.C.Z. Type No. 11079.

Rhyacophila fasciata Hagen

1859. Stettiner Ent. Ztg., 20:153.

Data in original description: A single male from Elberfeld.

Type male: M.C.Z. Type No. 11067. Bears a label which says "57", but no other data.

Rhyacophila paupera Hagen

1859. Stettiner Ent. Ztg., 20:153.

Data in original description: Prussia, Schlesien, on the Rhein (?), Archangel.

Lectotype female: M.C.Z. Type 11066, and a label bearing a word which might be "Schlesien".

OBSERVATIONS ON THE DISTRIBUTION OF TABANIDAE IN THE CARIBBEAN AREA, WITH NEW RECORDS OF SPECIES FROM TRINIDAD, B.W.I. (DIPTERA)

By E. McC. Callan
Department of Zoology and Entomology, Rhodes University, Grahamstown, South Africa[1]

Since the appearance of Dr. J. C. Bequaert's papers on the Tabanidae of Trinidad (1940, Bull. ent. Res., 30: 447-453 and 1944, Psyche, 51: 12-21), three further species have been found in that island. This brings the total to 34 species now known from Trinidad, B.W.I.

Dr. Alan Stone and Dr. G. B. Fairchild have kindly examined material of these three species. I am much indebted to Dr. Stone for the determination of *Tabanus* (*Chlorotabanus*) *inanis* Fabricius. To Dr. Fairchild I am very grateful for the determination of *Stibasoma sulfurotaeniata* Kröber var. and *Fidena* sp. near *niveibarba* Kröber and his remarks in regard to them.

An important discussion of the tabanid fauna of the Caribbean islands has been published by Bequaert (1940, Revista Ent., 11: 253-369), and Fairchild (1942, Ann. ent. Soc. Amer., 35: 441-474) has presented a very interesting résumé of the Tabanidae of Panama. The table below gives the number of species of Tabanidae known from various West Indian islands and adjacent parts of the Caribbean region with their approximate area in square miles.

It is evident that Trinidad, for its size, has an exceptionally rich Tabanid fauna. Indeed, Trinidad has more species of Tabanidae than any other comparable area in the Caribbean region. Further, no really intensive collecting of Tabanidae has ever been done in the island, most species collected by the late Dr. R. C. Shannon, myself and others having been taken casually in the course of other work. It seems certain that additional tabanids will be discovered in Trinidad. As Dr. Fairchild (*in litt.*, 1951) aptly points out ". . . . a number of species are strict halophiles and should be searched for in mangrove swamps, salt marshes and along sea beaches . . . others have restricted habitats in mountain forest, some being quite strictly arboreal."

---

[1] Observations were made while the writer was on the staff of the Imperial College of Tropical Agriculture, Trinidad, B.W.I.

Country	Approximate Area in Square Miles	No. of Species of Tabanidae Recorded
Panama	33,800	106
Venezuela	346,480	88
Honduras	46,000	22
Cuba	44,000	12
Hispaniola	28,250	17
Puerto Rico	3,500	8
Jamaica	4,200	10
Trinidad	1,750	34
Antigua	108	1
Dominica	304	1
St. Vincent	130	1
Barbados	166	1
Martinique	380	0
Guadeloupe	619	0
St. Lucia	233	0
Grenada	120	0

In Venezuela a comparatively small amount of collecting has been done, and the 88 tabanids known from that country probably bear little relation to the number actually occurring there. In Panama, with an area approximately one tenth that of Venezuela, Fairchild (1942, Ann. ent. Soc. Amer., 35: 441-474; 1951, ibid., 44:441-462) has recorded 106 species from intensive collections largely confined to the central part of the Isthmus.

The Lesser Antilles are a group of small oceanic islands disposed in an arc between the north-eastern corner of Venezuela and the eastern extremity of Puerto Rico. Guadeloupe and Martinique, the largest islands of the archipelago, are some 619 and 380 square miles in area respectively, while some such as the Grenadines are mere islets and even rocks. Here a very interesting situation obtains in regard to the tabanid fauna. In Antigua, Dominica, St. Vincent and Barbados only a single species is known with certainty from each island (see Bequaert, 1940, Revista Ent., 11:253-369). In Martinique, Guadeloupe, St. Lucia and Grenada apparently no Tabanidae have ever been recorded.

Indubitably the Lesser Antilles have a markedly depauperate fauna, and Bequaert (*loc. cit.*) has suggested that the paucity of large mammals may well be the cause of the scarcity of Tabanidae. Nevertheless, it is a remarkable fact that the family appears to be completely unrepresented in several of the larger islands of the group. I have searched personally in both Grenada and St. Lucia without finding any Tabanidae. As most tabanids are haematophagous, I have also made inquiries in these islands in regard to large blood-feeding flies attacking man or livestock, but no descriptions of such flies could conceivably refer to Tabanidae.

The fauna of Trinidad and that of Grenada have quite different affinities, the former lying with the South American continent and the latter with the Antilles. This is strikingly borne out by the Tabanidae. Although Grenada is visible from the Northern Range of Trinidad on a clear day, the two islands being separated by a channel only some 90 miles wide, Trinidad has a comparatively rich Tabanid fauna comprising 34 species, all of which are also known from South America, while in Grenada the family is completely absent.

Additional Records of Tabanidae from Trinidad, B.W.I.

Tabanus (*Chlorotabanus*) *inanis* Fabricius

St. Augustine, male, 8 Jan. 1948 (D. S. Blake).

Fairchild (1940, Revista Ent., 11: 713-722) mentions that he has seen specimens from Paraguay to British Honduras and that it has also been recorded from Mexico. Dr.

Fairchild (*in litt.*, 1951) informs me that ". . . . this species is very widespread in the neotropical region, is quite crepuscular or even nocturnal, being not rarely taken at light, and is often quite a pest of livestock."

Stibasoma sulfurotaeniata Kröber var.

St. Augustine, female, 12 Dec. 1948 (D. G. Austin).

The typical form was described from Para, Brazil and, as Dr. Fairchild (*in litt.*, 1951) points out, the Trinidad variety lacks complete yellow bands on the third and fourth tergites, although these are present at the sides.

Fidena sp. near *niveibarba* Kröber

Caura Valley, 2 females, biting man, 24 June 1945 (T. S. Jones) ; Maracas Valley, 3 females, biting man, 10 August 1945 (E. McC. Callan) ; Caura Valley, 4 females, biting man, 9 July 1949 (E. McC. Callan).

F. niveibarba was described from Minas Geraes, Brazil, and the Trinidad specimens are apparently closely allied to it. In Trinidad this species is very persistent in its attack. I have been bitten by it on numerous occasions while bathing in pools in the Maracas and Caura Rivers, and it has so far been found only in these two valleys of the Northern Range. It is rather strange that this species has not been previously recorded from Trinidad.

CAMBRIDGE ENTOMOLOGICAL CLUB

A regular meeting of the Club is held on the second Tuesday of each month (July, August and September, excepted) at 8:00 p.m. in Room B-455, Biological Laboratories, Divinity Ave., Cambridge. Entomologists visiting Boston are cordially invited to attend.

BACK VOLUMES OF PSYCHE

The Cambridge Entomological Club is able to offer for sale the following volumes of Psyche. Those not mentioned are entirely out of print.

Volumes 3, 4, 5, 6, 7, 8, each covering a period of three years, $5.00 each.

Volumes 10, 12, 14, 17, each covering a single year, $1.00 each.

Volumes 18, 19, 20, 21, 22, 23, 24, 25, 26, each covering a single year, $1.50 each.

Volumes 27 to 53, each covering a single year, $2.00.

Volumes 54 to 58, each covering a single year, $3.00.

Orders for 2 or more volumes subject to a discount of 10%.

Orders for 10 or more volumes subject to a discount of 20%.

All orders should be addressed to

F. M. CARPENTER, Editor of Psyche,
Biological Laboratories.
Harvard University,
Cambridge, Mass.

FOR SALE

The Ants of North America, by Professor Wm. S. Creighton. Published in April, 1950, as volume 104 of the Bulletin of the Museum of Comparative Zoology, with 585 pages and 57 plates. Price $10.00 (postpaid). Send orders to Museum of Comparative Zoology, Harvard College, Cambridge, Mass.

BLACK STEEL INSECT PINS

Trade Mark "Elephant", the ideal black insect pin. Trade Mark "Imperial", formerly Czechoslovakia. Both types in sizes No. 000-7. Also Minuten Nadeln. Request samples and prices from the manufacturer: Emil Arlt, Spezialnadelfabrik, Salzburg, 2, P.O. Box 76, Austria.

Used Insect Boxes For Sale at the Museum of Comparative Zoology, Cambridge 38, Mass. *Lot 1:* 196 over-sized Schmitts or Schmitt-type boxes in 7 "cans" (28 boxes in each can, in 2 columns) the boxes very well made and in good used condition, all of the same type, and measuring approx. 15 x 12 x 2½ in. outside and approx. 13¾ x 10¾ in. inside; at $100 for 28 boxes with can, or $675 for entire lot with cans, "as is" (a catch is broken on 1 box); preference will be given to a purchaser of the entire lot who can examine the boxes and pick them up at the museum; packing and shipment, if necessary, will be at buyer's expense; terms cash down. Address inquiries to P. J. Darlington, Jr., at the above address.